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Uterine Masses by MRI: Indications and Findings

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Abstract

The importance of uterus is the process of reproduction and conservation of the human in the earth as well as motherhood is the dream of every woman to give her sense of femininity and importance in this presence. The purposes of this study was to shed light on the importance of MRI and its diagnostic value for the different types of uterine masses in symptomatic patients. This study was conducted at Saudi German Hospital in the period (2015-2016). Data were retrospectively collected from 100 patients who had come to the Radiology Department from obstetrics and gynecology departments with different symptoms, age range (19-70) years and mean age (2.40) years. All patients were subjected to Magnetic Resonance Imaging. Out of 100 patient; (92) were diagnosed by MRI with different uterine masses while 8 cases showed normal result despite the presence of symptoms. Uterine fibroid (35%) was the most common pathologic findings, followed by cervical carcinoma (22%), endometrial carcinoma (14%), endometriosis (11%) and adenomyosis (10%). Uterine fibroids (27 out of 35)patient; was more frequent among patients in the age group of (20-49)y. Cervical carcinoma (12out of 22) cases; was more common among the age group of (20-49)year too. Endometrial carcinoma (7out of 14) cases was frequent among the age group of (>60)year. Endometriosis and Adenomyosis were common in the age group of (20-49) year. The study results reflect that Magnetic resonance imaging (MRI) is an excellent method for diagnosing and evaluating uterine masses.

Keywords: Cervical cancer ; Endometrial carcinoma ; Magnetic Resonance imaging ; Uterine fibroids.

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1. Introduction

Uterine masses are tissue enlargements of the uterus. They are either benign or malignant. Benign tumor is a mass of cells that do not invade neighboring tissue, whereas malignant tumors most of times can metastasize and invade tissue nearby [1].

The most common benign uterine tumors are fibroids with incidence of 217-3745 cases per 100 000 women-years and prevalence of 4.5-68.6% [2]. heavy menstrual bleeding is the most common symptom, which may lead to anaemia and painful periods[3,4]. also fibroids may cause infertility [5,6].

The most common malignant uterine tumor in the United States is endometrial carcinoma. The incidence of endometrial carcinoma is estimated to increase by 1–2% yearly [7].

Cervical cancer is the third most common malignancy in women worldwide [8]. It is one of the most successfully treatable cancers when discovered early[9]. According to American Cancer Society estimation for year 2018; about 13,240 new cases of invasive cervical cancer will be diagnosed and about 4,170 women will die from cervical cancer [9].

Computed tomography (CT) cannot differentiate between fibroids and uterine sarcomas, thus is not the choice for the characterization of pelvic masses[9,10]. It is limited in the pelvis by a lack of soft-tissue contrast [11].

Ultrasound cannot accurately differentiate between Uterine leiomyoma and leiomyosarcoma [12].

Magnetic Resonance Imaging (MRI) is a noninvasive and nonionizing imaging method that uses a magnetic field and radio waves to produce detailed images. previous studies concluded that Magnetic Resonance Imaging (MRI) is the most useful imaging method to evaluate uterine masses [11,13,14].

The aim of this work was to elicit the diagnostic value of MRI in evaluation of uterine masses in symptomatic female patients.

2. Material and methods

This retrospective study was conducted at Saudi German Hospital in the period (2015-2016). Data were collected from the records (PACS) for 100 patients who had come to the Radiology Department from obstetrics and gynecology departments with different symptoms such as Heavy menstrual bleeding, Dysmenorrhea, Back pain, Infertility, Post-menopausal bleeding and other symptoms, with age range (19-70) years and mean age of (2.40)years. All patients were subjected to magnetic resonance imaging using 3 Tesla MRI system (Magnetom verio, Siemens Medical systems, Erlangen, Germany).

2.1 Statistics

Magnetic resonance imaging findings of uterine masses were collected with demographic data including patient' age and symptoms. SPSS version 19 was used for data analysis and the results illustrated accordingly.

3. Result

The pelvis is an ideal area for MRI imaging because of high proton density, good inherent contrast to noise ratio. Hence, MR Imaging was the best and most appropriate way to diagnose uterine masses.

In this study the total number of female patients was 100 with 100 uetrine tumor. Patients came with different symptoms and all patients underwent magnetic resonance imaging.

(Table 1) reflects the distribution of age group for 100 female patients, the age group of (20-49) years reflected high frequency compared to the other age groups.

Heavy menstrual bleeding was the most common symptoms among the study group(Table2).

Pathologic findings of female uterus revealed uterine fibroids were the most common pathology among the study group. (Table 3)

There was a strong correlation between patient age and uterine mass incidence. (Table 4)

4. Discussion

The current study reflects the ability of MRI technology in the diagnosis and classification of various uterine masses in a symptomatic patients.

After analyzing patient's data, I fully realized that the diagnosis and characterization of uterine masses by magnetic resonance technology is one of the best ways to produce results that are impressive and reliable.

Of 100 patient; (92) were diagnosed with different uterine masses and only (8 patient) diagnosed as normal (Tables 3,4).

(Table and Figure 1) reflects the age distribution by using the class intervals and frequencies for the study group. Age group of (20-49)y represented high frequency (66%) followed by age group of (50-60) with frequency of (22%) . <60 were (10%) and the least was the age group of (<20) with frequency of(2%) only.

From the collected data, patients were found to have different symptoms as shown on (Table2). Heavy menstrual bleeding (27 patients) was one of the most common symptoms among patients followed by post menopausal bleeding (21 patients), dysmenorrhea and back pain presented in (10 patients), pelvic pain (7 patient), Increased vaginal discharge (4 patients), and (3 patient) for each of Severe menstrual cramps-prolonged menstrual bleeding and frequent urination. Spotting between periods and Abnormal vaginal discharge were the least (one patient each).

Uterine fibroids were the most common pathology among the study group, they were in 35% (35patient), this result is in agreement with (Radmila S. and his colleagues -2016) [15], followed by cervical carcinoma 22% (22patient), endometrial carcinoma 14% (14patient), Endometriosis 11% (11patient) and adenomyosis 10% (10

patient) (Table3 and figure3).

The current study shows that there is a relationship between the ages of patients and the incidence of uterine tumors (Table4). The incidence of uterine fibroids (Total cases=35) in the age group of (20-49)y was high (27patient), this result copes with (Radmila S. and his colleagues-2016) who stated (Myomas are the most common benign neoplasm of the reproductive organs in women of reproductive age) [15]. Followed by the age group of (50-60)y (7patient), and only (one patient) found with uterine fibroids (<20)y .

In cervical carcinoma (Total cases=22); the age group of (20-49) y, was the more affected group (12patient) followed by the age group of (50-60)y, (7patient), this result was in agreement with (SEER cancer statistics-2016) who reported;(From 2006-2012, the median age of cervical cancer diagnosis was 49 but still older women remain at risk) [16]. There were (3patient) in the age group of (>60)y. No patient among the age group of (<20)y founds to have cervical cancer, this result was in accordance with (American Cancer Society-2016) who reported; (Cervical cancer is rare in women younger than age 20) [17].

The incidence of endometrial carcinoma (Total cases= 14) was more common among the age group of (>60)y (7patient), this result coincides with (American Cancer Society-2018) who reported; (Endometrial cancer affects mainly postmenopausal women and the average age is 60) [18]. Followed by the age group of (50-60)y (6patient).

The incidence of endometrial carcinoma in the group study of (20-49)y, was only (one patient), this result agrees with (American Cancer Society-2018) who reported; (endometrial cancer is uncommon in women under the age of 45) [18].

Endometriosis (Total cases=11) was more common among the age group of (20-49)y (10 patient), whereas the incidence of endometriosis in the age group of (<20) y, was only (One patient).

Adenomyosis (Total cases=10) was common among the age group of (20-49)years (9 patient), and (One patient) for the age group of (50-60)y.

Endometriosis and adenomyosis are characterized by the presence of endometrial tissue in other places rather than normal ones[19].

The results of this study (Table 4) showed that the incidence of these two diseases was common among the age group of (20-49)y (reproductive age), this result was in agreement with (Parente Barbosa C and his colleagues -2011) who stated that; (Endometriosis and adenomyosis are considered to be a problem mainly before menopause) [20].

Although from my result I had an incidence of adenomyosis-one patient- among the age group of (50-60)y (beyond reproductive age)

It is noted that I have agreed with all results of authors regarding the use of magnetic resonance imaging in the

diagnosis of various uterine masses. which confirms the effectiveness and reliability of this wonderful and exciting technology.

5. Tables

Table 1: Distribution of Age Group for 100 Patients

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<20	2	2.0	2.0	2.0
	20-49	66	66.0	66.0	68.0
	50-60	22	22.0	22.0	90.0
	>60	10	10.0	10.0	100.0
	Total	100	100.0	100.0	

Table 2: Symptoms and Signs of Uterine Masses in 100 Patients

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Heavy menstrual bleeding	27	27.0	27.0	27.0
	Post menopausal bleeding	21	21.0	21.0	48.0
	Dysmenorrhea	10	10.0	10.0	58.0
	Constipation	2	2.0	2.0	60.0
	Back pain	10	10.0	10.0	70.0
	Infertility	6	6.0	6.0	76.0
	Severe menstrual cramps	3	3.0	3.0	79.0
	Spotting between periods	1	1.0	1.0	80.0
	Pelvic pain	7	7.0	7.0	87.0
	Increased vaginal discharge	4	4.0	4.0	91.0
	Blood spots following periods	2	2.0	2.0	93.0
	prolonged menstrual bleeding	3	3.0	3.0	96.0
	Frequent urination	3	3.0	3.0	99.0
	Abnormal vaginal discharge	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Table 3: MRI Pathologic Findings Through 100 Symptomatic Patients

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Uterine fibroids	35	35.0	35.0	35.0
	Cervical carcinoma	22	22.0	22.0	57.0
	Endometrial carcinoma	14	14.0	14.0	71.0
	Endometriosis	11	11.0	11.0	82.0
	Adenomyosis	10	10.0	10.0	92.0
	Normal uterus	8	8.0	8.0	100.0
	Total	100	100.0	100.0	

Table 4: Correlation Between Age Group and the Incidence of Uterine Masses

			Age Group				Total
			(<20)y	(20-49) y	(50-60) y	(>60)y	
MRI Results	Positive	Uterine fibroids	1	27	7	0	35
		Cervical carcinoma	0	12	7	3	22
		Endometrial carcinoma	0	1	6	7	14
		Endometriosis	1	10	0	0	11
		Adenomyosis	0	9	1	0	10
	Negative	Normal uterus					8
		Total					100

6. Conclusion

Based on this research and related findings, I can say, in agreement with many previous studies, that MRI technology is reliable in diagnosing and evaluating benign and malignant uterine tumors in addition to its safety compared to other imaging modalities.

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